

# City of Peterborough

## Sidewalk Strategic Plan

### Phase 1 - Sidewalks



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# City of Peterborough Sidewalk Strategic Plan Phase 1 – Sidewalks

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# City of Peterborough Sidewalk Strategic Plan

## 1.0 INTRODUCTION

### 1.1 Background

Through the Official Plan, Transportation Plan, Access Plan and Active 2010, the City of Peterborough has expressed a clear commitment and desire to support walking as a mode of travel and recreation. The 2002 Transportation Plan includes adoption of targets to increase walking supported by two-dozen recommendations. The other Plans also include pedestrian supportive policies and recommendations. As a later part of this project, a Provision of Sidewalk Policy and a Sidewalk Implementation Procedure for Existing Sidewalks were developed (see Appendix F). These are being presented to Council with the Sidewalk Strategic Plan recommendations. For a complete description of current City policies related to pedestrian infrastructure developed up to the time of the strategic plan, refer to Appendix E.

Sidewalk infrastructure is a key component of urban design that supports walking. Sidewalks separate pedestrians from vehicular traffic and contribute significantly to creating a pedestrian friendly environment. Ramps on sidewalks at crossing points are critical for persons with a mobility disability and beneficial to those who have difficulty with curbs, including people with strollers and elderly people. The provision of sidewalks and sidewalk ramps can be a factor in determining whether a citizen can access public transit. All transit users are pedestrians at the beginning and end of every trip.

The concept for the Sidewalk Strategic Plan was inspired by similar work completed in Kelowna, British Columbia. The City is grateful to Kelowna for generously sharing their Sidewalk Master Plan and related project ideas.

### 1.2 Sidewalk Strategic Plan Purpose

The purpose of the Sidewalk Strategic Plan is to create a process to prioritize sidewalk projects within the City of Peterborough, including:

- new sections of sidewalk, and;
- sidewalk ramps (for accessibility) on existing sidewalks.

The scope of this project includes missing sections of sidewalk and sidewalk ramps in existing developments throughout the city. The project does not include sidewalk repairs, which are handled through the Public Works Division.

This comprehensive analysis of sidewalk and curb cut needs will be an important tool in guiding sidewalk capital expenditures within the City. The plan may also be used as a preventative risk management tool for the municipality. Currently, the City relies on ad hoc community input and staff suggestions to set priorities. This Plan will facilitate maximum benefit derived from capital expenditures on pedestrian facility investments made by the City over the short and long term, while creating efficient and accessible pedestrian linkages throughout the community.

### **1.3 Project Team**

The inter-departmental project team includes the following City staff members:

Lisa DeFlorio, Accessibility Co-ordinator  
Mary Gallop, Manager of Recreation  
Susan Sauvé, Transportation Demand Management Planner, project leader  
Nicole Schleifer, GIS Technologist  
Richard Straka, Policy Planner

The team draws on a larger resource network that includes Student Transportation Services of Central Ontario staff, Active and Safe Routes to School Committee, Active and Safe Community Routes Committee and the Council for Persons with Disabilities Transportation Sub-Committee.

### **1.4 Project Process**

Recognizing that there are limited resources to address sidewalk gaps and curb cut needs, the Sidewalk Strategic Plan uses a matrix (set of criteria) to rank missing sidewalk segments and curb cuts.

The process for developing the Sidewalk Strategic Plan included:

1. Updating sidewalk data in corporate GIS system to ensure it accurately reflects locations of existing sidewalks, sections of no sidewalk and curb cuts.
2. Developing a set of criteria for ranking segments of no sidewalk and curb cuts.
3. Sourcing data that reflects the criteria and incorporating data into the GIS system if it is not yet there.
4. Testing the matrix to determine its effectiveness. Rankings should reflect expected pedestrian demand and road safety factors. The results are shown in a table of ranked sidewalks and a map showing missing sidewalks according to level of priority for development. When

the data is available, there will be a table and a map showing the rankings for curb cuts as well.

5. Refining the criteria based on input from project team and local groups/organizations with a walking interest.
6. Applying the criteria using GIS to the City's existing sidewalk map and undertaking data analysis.
7. Creating a report incorporating the maps and tables produced in the GIS analysis. Prepare associated report to Council.
8. Circulating approved report to relevant staff and stakeholder groups.
9. Updating the municipal sidewalk map on an annual basis, reflecting completed projects and new developments.
10. Creating a new Sidewalk Policy and Implementation Procedure.

## **2.0 SIDEWALK DATA**

### **2.1 Sidewalks**

All segments of sidewalk and no sidewalk are recorded as a distinct layer of data in the City's GIS system. Orthophotos and construction/development information are used to update the data. For the purpose of this project, orthophotos from the spring of 2005 were used to update sidewalk data in the corporate GIS system. To verify orthophotos, all data was also field checked. These methods will continue to be used to keep the data current. Land annexed on January 1, 2008 and sidewalks built in 2006 and 2007 were incorporated into the dataset.

### **2.2 Sidewalk Ramps**

Initially, it appeared as though this data was in the GIS system. A closer look revealed that this set of data had not yet been recorded. The Traffic Operations Division summer student was given the task of recording this data in summer 2006. However, it was inefficient using the portable GIS system. When the Council for Persons with Disabilities was consulted about the potential of collecting additional data while in the field, they responded positively. To more effectively collect this data, a personal data device will be purchased and the analysis will be completed for this aspect of the project once the data is captured. A supplementary report will be prepared with the results.

## **3.0 CRITERIA FOR RANKING SIDEWALKS**

### **3.1 Development of Criteria**

The project team developed a set of criteria to reflect pedestrian demand and risk. The criteria were carefully developed, ensuring that all data is available for

the criteria and the data can be readily updated within the GIS system. Using the GIS system is key to being able to readily update the analysis.

The criteria were applied to all missing segments of sidewalk and the results were shown on a map and on a table. Assessing the results for anomalies, the team refined the criteria several times. The criteria were then reviewed by the Active and Safe Routes to School Committee, Student Transportation Services of Central Ontario and the Active and Safe Community Routes Committee, which includes a representative from the Council for Persons with Disabilities. The criteria were further refined based on feedback from these groups and re-tested.

### 3.2 Description of Criteria

The criteria and the source of the data to apply the criteria are described in the following table. The criteria data will need to be updated whenever the Plan is reviewed, with a target of every three years.

**Table 1: Description of Criteria**

Criteria	Description	Value	Source of Data
1. Type of Road <sup>1</sup>	Arterial	20	Layer in corporate mapping system, automatically updated
	Collector	10	
	Local	0	
2. Major Pedestrian Generators	Within 500 m of a hospital, transit terminal, library, Wellness Centre, Y <sup>1</sup>	10	Most in corporate mapping system, Y added manually
	Within 500 m of: <sup>2</sup>		
	• retirement or nursing home	5	Corporate mapping system
	• accessible housing complex	5	Lisa DeFlorio, added manually
	• high density housing	5	Tax assessments, 8 + units
	• major medical clinic, health unit	5	Sue Sauve (phone book)
	• arena	5	Corporate mapping system
• major tourist attraction, public building where the public is invited (art gallery, museum), community centre	5	Sue Sauve, Nicole Schleifer, Mary Gallop	
3. School Zones <sup>1</sup>	Within designated walking zone of an elementary school with 200+ walkers	20	Student Transportation Services of Central Ontario, individual maps for each school showing walking polygon and potential walkers being bussed (inclusive segments only i.e., whole segment within the walking zone)
	Within designated walking zone of an elementary school with less than 200 walkers	15	
	Within designated walking zone of a secondary school with 200+ walkers	15	
	Within designated walking zone of a secondary school with less than 200 walkers	10	
	Within 1 km of a college or university	10	

4. Areas of Concern Within School Walking Zones <sup>1</sup>	Within designated walking zone of an elementary or secondary school and bussing being provided due to missing sidewalk(s)	20	As provided by SYSCO
	Within designated walking zone of an elementary or secondary school and students walking, but section is an area of concern	10	
5. Transit Routes <sup>1</sup>	Roads that are transit routes	20	Corporate mapping system (inclusive streets only, not streets touching)
6. Commercial Areas <sup>1</sup>	Within the downtown (central area)	20	Corporate mapping system, Official Plan
	Within 500 m of a major shopping centre	15	Corporate mapping system, Official Plan
	Within 500 m of any other OP designated commercial area (includes special purpose retail, neighbourhood centre, service commercial), C1 zoning and a convenience store	10	Corporate mapping system, Zoning By-law (C1 designation), plus any convenience stores not covered by C1 zoning
7. Trails and Parks <sup>1</sup>	Within 500 m of a trail or within 250 m of a park	10	Official Plan Schedule B(a) revised to distinguish trail vs. cycling lanes and developed vs. undeveloped trails, corporate mapping system for parks
8. No sidewalks on either side		20	GIS data analysis, does not apply to cul-de-sacs

<sup>1</sup> denotes categories that have a singular value and points are not cumulative

<sup>2</sup> denotes categories where cumulative points are attributed

In the development of the criteria, consideration was given to land uses and pedestrian traffic, recognizing that children and seniors are vulnerable age groups. To reflect this, there are two categories that include schools. One is the school-walking zone. Within this zone, school bus transportation is not provided and students are expected to walk to school. The second category identifies areas of concern in school walking zones and in some cases, students are bussed due to some sort of traffic hazard, often a lack of sidewalks on an arterial or collector road. There are many benefits to students walking to school rather than being bussed, including improved air quality when fewer school buses are required. Retirement and nursing homes are within the major pedestrian generator category.

High pedestrian generators are assigned cumulative points. If there is a hospital, beside a retirement home and next to multi-residential housing, points accumulate within a 500 m buffer. Highest points are assigned to the hospital, the transit terminal, the library, the Sport & Wellness Centre and the Y.

Arterial and collector roads are assigned priority over local roads because traffic volumes and speeds are higher, creating potential risk for pedestrians where there is no sidewalk. Transit routes are included as criteria because transit users need sidewalks to access bus stops.

Roads where there is no sidewalk on either side are assigned 20 points, recognizing that the provision of a sidewalk on one side is generally better than no sidewalk. In some cases, roads with a sidewalk on one side still rank very highly due to the accumulation of points in other categories. On arterial and collector streets, there may not be a safe place to cross for some distance. Cul-de-sacs have lower volumes of traffic and are therefore not assigned points when there is no sidewalk on either side. In this way, cul-de-sacs are given less priority than other streets.

Commercial areas and parks and trails are criteria due to the pedestrian traffic associated with them. The downtown area is assigned the highest number of commercial points, followed by major shopping centres, then other commercial areas designated in the Official Plan, as well as areas with a convenience store.

### **3.3 GIS Application of Criteria**

Each of the criteria listed above are applied to all segments of missing sidewalks within the City using GIS for the analysis. For example, one missing section of sidewalk may be assigned points in this way:

- if it is on a transit route, 20 points are assigned;
- 20 for being on an arterial road;
- 20 for being in the downtown, etc.

Thematic maps can be used to illustrate what the criteria are measuring. Due to the size of the maps, a sample only of each map is provided with this report, found in Appendix B.

Two products are created through the GIS analysis:

- i) a table that ranks all sections of no sidewalk and indicates when points are assigned, and;
- ii) a map that shows all sections of no sidewalk and assigns a priority of one to four.

The table shows the results with a row for each missing segment of sidewalk and a column for each criterion. The table with the sidewalks ranked by points is shown in Appendix C. The data can be sorted in many different ways, such as by segments of missing sidewalks in school zones. For the purpose of this report, only the overall results are displayed.

On the map, each segment of missing sidewalk is shown and categorized into one of four levels of priority according to the number of points assigned in the GIS analysis, as shown below. The map is shown in Appendix D.

First priority	100+ points
Second priority	75-99 points
Third priority	50-74 points
Fourth priority	0-49 points

## 4.0 Sidewalk Data Analysis

The following tables illustrate of the amount of sidewalks and no sidewalks along City streets by street type, along transit routes and by priority according to the results of the GIS spatial analysis.

**Table 2: No Sidewalks by Level of Priority**

<b>Priority Level</b>	<b>No Sidewalks (metres)</b>	<b>Percentage</b>
1	5,078	1%
2	36,301	9%
3	179,675	46%
4	172,425	44%
Total	393,479	100%

**Table 3: Sidewalks by Road Classification**

<b>Road Classification</b>	<b>Sidewalks (metres)</b>	<b>No Sidewalks (metres)</b>	<b>% with Sidewalks</b>
<b>Arterial</b>			
Priority 1		3,928	
Priority 2		14,893	
Priority 3		38,677	
Priority 4		33,942	
<b>Sub-Total</b>	<b>93,749</b>	<b>91,440</b>	<b>51%</b>
<b>Collector</b>			
Priority 1		433	
Priority 2		7,169	
Priority 3		18,446	
Priority 4		29,782	
<b>Sub-Total</b>	<b>85,257</b>	<b>55,831</b>	<b>60%</b>
<b>Local</b>			
Priority 1		717	
Priority 2		14,239	
Priority 3		122,551	
Priority 4		108,701	
<b>Sub-Total</b>	<b>153,377</b>	<b>246,208</b>	<b>41%</b>
<b>Misc. Walkways, Expressway Ramps, etc.</b>	<b>9,090</b>	<b>0</b>	
<b>TOTAL</b>	<b>355,972</b>	<b>393,479</b>	<b>47%</b>

**Table 4: Sidewalks Along Transit Routes**

	<b>Sidewalks (metres)</b>	<b>No Sidewalks (metres)</b>	<b>% with Sidewalks</b>
<b>Transit Routes</b>	<b>114,977</b>	<b>56,574</b>	<b>67%</b>

A segment of sidewalk is defined as the space from one intersection/block to the next on one side of the road. The percentage of roads that are reported as having sidewalks is related to the length of curb lane for a road. In other words, a 1 km length of road would have 2 km of sidewalks (one on each side) for it to have 100% of its sidewalks.

Overall, 47% of roads have sidewalks in the City of Peterborough. Along transit routes, 67% of roads have sidewalks. Only 1% of missing sidewalks (by length)

are classified as priority 1 according to the criteria that were developed. Of the 2,073 sections of missing sidewalk, only 32 are priority level 1. In terms of length, of the 393,479 metres of road with no sidewalk, 5,078 metres are priority 1.

This data provides an analytical tool for evaluation and comparing sidewalk need. The data has limitations and individual assessments are still required when individual sidewalk segments are considered for construction. Examples of limitations of the data include elevation (hills can affect sight lines for vehicles and pedestrians) and existing conditions that impact desire for construction or cost (such as mature trees the in zone of construction or embankments along the edge of the road). When a road reconstruction project is planned that will change the road geometry; the sidewalk should be built as part of the project. The Sidewalk Plan is a valuable tool for prioritizing sidewalk construction projects, but it does not replace individual assessments prior to construction.

## 5.0 Sidewalk Costs

The total cost to build all the missing sidewalks in the city is estimated at \$6.6 million. Table 5 outlines the estimated construction costs for sidewalks by level of priority. The benefit of creating the Sidewalk Strategic Plan is that it prioritizes the missing sidewalks. The cost to build the priority 1 and 2 sidewalks is \$6,665,835.

The construction of new sidewalks occurs as separate capital projects in the Engineering and Construction Division of Utility Services and as part of road reconstruction projects. Once sidewalks are constructed, the annual cost for winter maintenance is \$910 per kilometre. The cost to replace sidewalks needing repair is \$245 per metre.

**Table 5: Sidewalk Construction Costs by Level of Priority**

<b>Priority Level</b>	<b>No Sidewalks (metres)</b>	<b>Cost in 2007 Dollars *</b>
1	5,078	\$812,503
2	36,301	\$5,808,069
3	179,675	\$28,748,019
4	172,425	\$27,588,062
Total	393,479	\$62,956,653

\*Assumes an average cost of \$160,000 per km.

## **6.0 Implementation Plan for Priority 1 and 2 Sidewalks**

A ten-year schedule for the implementation of sidewalks assessed as priority 1 and 2 has been developed and is provided in Appendix A. Sections of sidewalk that will be constructed as part of road reconstruction projects are identified. Sections of sidewalk on the same street are grouped together. Each section of sidewalk will be assessed on its own merit in the year it is assigned, and if recommended for construction, adjacent property owners will be consulted. The 10-year schedule is an overview and each project will need to be evaluated on its own merit.

The ten-year schedule includes \$6.7 million in sidewalk projects, with \$1 million associated with planned road reconstruction projects. The average annual amount to be funded from the sidewalk capital budget will be \$563,303. Currently, \$300,000 is budgeted for sidewalk construction annually. Funding for the additional \$260,000 can be sourced from additional capital allocation, federal gas tax credits, development charges and development agreements.

It is recommended that the Sidewalk Plan be revisited when all the priority 1 and 2 sidewalks that can be built have been built, and that a data base be developed to keep track of all missing sidewalk segments, including reasons why a segment was not constructed, requests, etc. In some cases, a sidewalk may not be constructed to due mature trees, but if the trees are removed or come down, the sidewalk could then be constructed.

Adjacent property owners/occupants normally have mixed reactions to proposed sidewalk projects. New sidewalks are a substantial physical change to a boulevard. Some municipalities have developed detailed policies to address whether a sidewalk should or should not be built depending on input from residents and whether the road is an arterial, collector or local street. In the case of the priority 1 and 2 sidewalks, unless there is a barrier to construction or other logical reason not to construct a sidewalk, these sidewalks should be built to support the needs of the broader community.

## **7.0 Other Sidewalk Strategic Plan Applications**

The criteria were developed in such a way that each one can be used in GIS spatial analysis. This means that the criteria can be mapped and displayed visually. Another important consideration was the ability to readily update the data and the analysis. As new sidewalks are built and schools, commercial areas and major pedestrian generators change, it will be important to update the data and analysis.

The Sidewalk Strategic Plan can be used by:

- General public to see where sidewalks are provided. This can be provided through on-line mapping on the City's website
- Planning and Development Department to assist with planning policy development, site plan evaluations and other planning initiatives
- Recreation Division in determining access to trails and parks
- Traffic Technical Committee to evaluate new sidewalk requests
- Transportation Division and Council for Persons with Disabilities in mapping accessible pedestrian routes
- Engineering and Construction Division and Council to prioritize new sidewalk construction projects
- School Transportation Services of Central Ontario when determining walking and bussing needs of students
- City Council as a tool to assess requests for new sidewalks

## **8.0 Conclusions**

The Sidewalk Strategic Plan uses GIS analysis to map and prioritize sidewalk construction projects. The data and analysis can be readily updated, so the Sidewalk Strategic Plan can remain current for many years. With the Sidewalk Strategic Plan, competing needs for pedestrian infrastructure can be evaluated. Walking is a high priority within the City of Peterborough and the construction of priority 1 and 2 sidewalks will further enable pedestrian activity throughout the City.

## **Appendix B – Samples of Criteria Mapping Results**

Mapping samples are provided for each of the criteria described in Table 1 of the Sidewalk Strategic Plan.

### **Sample maps are provided in this appendix for:**

Criteria 1: Type of Road

Criteria 2: Major Pedestrian Generators

Criteria 3: School Zones

Criteria 4: Areas of Concern within School Walking Zones

Criteria 5: Transit Routes

Criteria 6: Commercial Areas

Criteria 7: Trails and Parks

Criteria 8: No Sidewalks on Either Side